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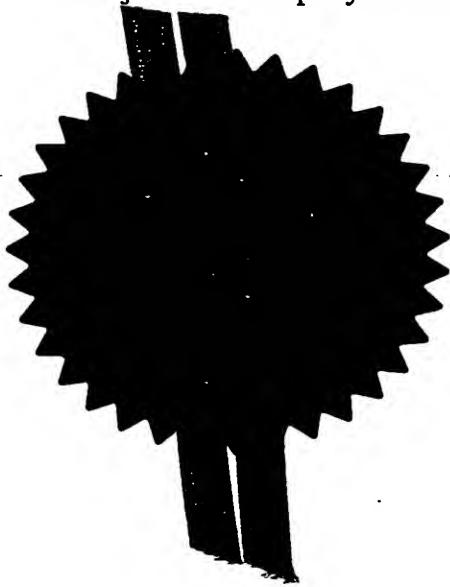
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AGROCHEMICAL COMPOSITION

The present invention relates to an agrochemical composition and in particular to an aqueous composition comprising an agrochemical active ingredient and an
5 adjuvant.

Agrochemical active ingredients are generally utilised in combination with an adjuvant, which is frequently a surfactant. Most commonly adjuvants are added to enhance the bioperformance of the active ingredient and many such bioperformance enhancing adjuvants are known to those skilled in the art. We have now found that
10 certain amines or amides provide effective bioperformance enhancement of the active ingredient despite having little or no surfactant properties.

According to the present invention there is provided an agrochemical composition comprising an agrochemical active ingredient and a amine or amide selected from the group consisting of quinuclidine or a salt thereof, N-(aminopropyl)
15 morphilene, 1-(2-hydroxethyl-2-imidazolidinone) and aminoethylpiperazine or a salt thereof.

The amines of the present invention are basic compounds and if used in its basic form may be incompatible with base-sensitive agrochemicals such as paraquat as well as being a potential hazard to human exposure. It is preferred therefore that in
20 normal use and in particular when used with base-sensitive agrochemicals, the amines of the present invention are neutralised in whole or part. The amines of the present invention may conveniently be neutralised by the addition of acid, for example a mineral acid such as a halide acid, for example hydrochloric acid or an organic acid such as acetic acid. The amines of the present invention may also however be
25 neutralised by the addition of any suitable anionic acid species, including anionic surfactants as will be described in greater detail below. The term "a salt of the amines of the present invention" as used herein includes the amines of the present invention whether wholly or partially neutralised by an anionic species and does not necessarily imply the physical association of the amine cation and the anionic species in the
30 composition. It will generally be convenient to neutralise or partially neutralise the amines of the present invention prior to incorporation in the composition of the invention.

The term agrochemical as used herein includes without limitation herbicides, insecticides, fungicides, plant growth regulators and seed treatment agents. It is preferred that the agrochemical composition is an aqueous composition and it is especially preferred that the agrochemical is a water-soluble agrochemical.

5 The aqueous agrochemical composition will generally be applied to the target by spraying and the composition may be a concentrate which is designed to be diluted with water prior to application or may be ready for application. Specifically, the amines or amides of the present invention or a salt the amine may be incorporated into the spray composition prior to application as a tank mix or may form a component of an

10 agrochemical concentrate intended for dilution prior to use. It is a particular advantage of the salts of amines or amides of the present invention they are readily soluble in water and are generally compatible with water-soluble agrochemicals. Salts of amines of the present invention are thus particularly suitable to be "built-in" to a concentrate comprising a water-soluble active ingredient.

15 Suitable agrochemical active ingredients are known to those skilled in the art and are listed in standard reference works such the Pesticide Manual. As examples of suitable water-soluble active ingredients there may be mentioned paraquat, diquat, glyphosate, fomesafen, thiamefoxam, mesotrione, and trifloxsulfuron. By the term "water-soluble" agrochemical is meant an agrochemical having a solubility in water

20 of at least 1 g/l and preferably at least 4 g/l, for example at least 100g/l. Of course many agrochemicals have a much higher solubility, for example 300 g/l or more or up to 500 or 600 g/l or more. Paraquat and diquat are particularly suitable agrochemical active ingredients

Thus according to a further aspect of the present invention there is disclosed

25 an aqueous agrochemical composition comprising paraquat or diquat and a salt of quinuclidine, a salt of N-(aminopropyl) morphiline, 1-(2-hydroxethyl-2-imidazolidinone) or a salt of aminoethylpiperazine.

According to a still further aspect of the present invention there is disclosed an aqueous agrochemical concentrate composition comprising paraquat or diquat and a

30 salt of quinuclidine, a salt of N-(aminopropyl) morphiline, 1-(2-hydroxethyl-2-imidazolidinone) or a salt of aminoethylpiperazine wherein the concentration of the paraquat or diquat is greater than 100 g/l.

Typically the pH of the paraquat or diquat composition of the invention will be from 3.0 to 8.0 and preferably from 4.0 to 8.0. In general the pH of the amine is adjusted with acid approximately to that of the paraquat or diquat composition and those nitrogen atoms of the amine which are sufficiently basic become protonated.

5 The amines or amides of the present invention when used as sole adjuvant may provide effective bioperformance enhancement. There may be advantages however in using the amines or amides of the present invention in combination with a second adjuvant. The second adjuvant is preferably a surfactant. There is no particular limitation on the surfactant that may be used and numerous examples will occur to
10 those skilled in the art. We have found that anionic, cationic, non-ionic or amphoteric surfactants may be effective.

As noted above the amines of the present invention may form a salt with an anionic surfactant or a surfactant having an acidic form. If desired, such a salt may be pre-formed by the reaction of the amines of the present invention with the anionic
15 surfactant, for example in aqueous solution, but there is no particular need for such pre-reaction.

The ratio by weight of the amines or amides of the present invention to the surfactant may vary within wide limits, for example from 50:1 to 1:50, and in particular from 10:1 to 1:1 by weight. In some instances a small proportion of the
20 amines or amides of the present invention may have a surprisingly large effect in enhancing the bioefficacy of conventional surfactants. Thus for example a ratio of the amines or amides of the present invention to the surfactant of from 1:1 down to 1:25 by weight, for example from about 1:4 to 1:15 may show significant enhancement of the bioefficacy of the surfactant.

25 The ratio by weight of the amines or amides of the present invention to the agrochemical active ingredient is preferably from 1:10 to 10:1, for example from 1:4 to 1:1. When the amines or amides of the present invention are used in combination with one or more additional adjuvants, for example additional surfactants, the ratio by weight of the total adjuvant (amine of the present invention plus additional
30 surfactants) is preferably from 1:10 to 10:1, for example from 1:4 to 1:1. The composition may contain further additives conventional in the art.

The invention is illustrated by the following Examples in which all parts and percentages are by weight unless otherwise stated.

EXAMPLE 1

The bioperformance enhancement of paraquat in the presence of amines or amides of the present invention was evaluated. The amines or amides were tested and the results are presented in Table 1. An aqueous formulation of paraquat dichloride containing 0.5% by weight of the quinuclidine (based on the weight of the amine salt), N-(aminopropyl) morpholine (based on the weight of the parent amine) or 1-(2-hydroxethyl-2-imidazolidinone) (based on the weight of the amide), all based on total spray volume was applied using a moving track sprayer to eight representative weed species at 10, 20 and 40 g /ha (based on paraquat ion). The spray volume was equivalent to 200 l/ha. For aminoethylpiperazine the formulation contained 0.625% by weight of the amine (based on the parent amine).

Three replicates of each test were undertaken and the biological data (%) activity where 0% represents no herbicidal effect and 100% represents complete kill) at 7 days after treatment is expressed in Table 1 as a mean over all species based on an average response over the combined rates. The results are compared with an equivalent formulation containing only paraquat chloride.

Table 1

Amine or Amide of the Present Invention	Mean Activity (%)
None	54
Quinuclidine as hydrochloride salt	68
N-(Aminopropyl) morphiline as hydrochloride salt	65
1-(2-hydroxethyl-2-imidazolidinone) as hydrochloride salt	66
Aminoethylpiperazine as hydrochloride salt	72

CLAIMS

1. An agrochemical composition comprising an agrochemical active ingredient and a amine or amide selected from the group consisting of quinuclidine, N-(aminopropyl) morphiline, 1-(2-hydroxethyl-2-imidazolidinone) and
5 aminoethylpiperazine or a salt of said amine
2. An aqueous agrochemical composition comprising paraquat or diquat and a salt of quinuclidine, a salt of N-(aminopropyl) morphiline, 1-(2-hydroxethyl-2-imidazolidinone) or a salt of aminoethylpiperazine.
3. An aqueous agrochemical concentrate composition comprising paraquat or
10 diquat and a salt of quinuclidine, a salt of N-(aminopropyl) morphiline, 1-(2-hydroxethyl-2-imidazolidinone) or a salt of aminoethylpiperazine wherein the concentration of the paraquat or diquat is greater than 100 g/l.